PATENT ABSTRACTS OF JAPAN

(54) REPRODUCER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a reproducer that reproduces video data consisting of the tracks within the range of reproduction capability.

SOLUTION: The reproducer 10 for reproducing data from a record medium having tracks on which image data and one or more pieces of edit data are recorded comprises an input means 11 for reading data from the record medium, an analyzing means 12 for identifying the type of recording tracks on which input data are recorded, a storage means 13 for storing a priority list cross- referencing the type of the tracks with a decoded processing sequence and storing a prescribed threshold value deciding up to which of the sequences the image data are to be recorded, a plurality of decoding means 15, 16, 17 that respectively decode each of the data, and a discrimination means 14 that discriminates whether or not the input data are to be decoded on the basis of the type of the tracks from the analyzing means 12 and the priority list/ prescribed threshold value of the storage means 13, and provides an output to a plurality of the decoding means 15, 16, 17 depending on the type of the data when the means 14 decides the input data are to be decoded.
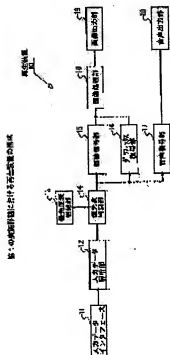
(51)Int.Cl.⁷	識別記号		ＦＩ		テーマコード（参考)
Ｈ０４Ｎ	5/91		Ｈ０４Ｎ	5/76	Ｚ　5C052
Ｇ１１Ｂ	27/034			5/91	Ｎ　5C053
Ｈ０４Ｎ	5/76			5/92	Ｈ　5D110
	5/92		Ｇ１１Ｂ	27/02	

審査請求　有　　請求項の数9　ＯＬ　（全 26 頁）

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(54)【発明の名称】　再生装置

(57)【要約】

【課題】　本発明は、再処理能力の範囲内で複数のトラックからなる映像データを再生する再生装置に関する。

【解決手段】　本発明では、画像データと1以上の編集データとが複数のトラックに各々記録される記録媒体を再生する再生装置10において、記録媒体から各データを読込む入力手段11と、入力データの記録トラックの種別を判別する解析手段12と、トラックの種別と復号する処理の順番とを関係付ける優先順位表と、どの順番まで再生するかを決定する所定の閾値とを記憶する記憶手段13と、各データを各々復号する複数の復号手段15、16、17と、解析手段12からのトラックの種別と記憶手段13の優先順位表・所定の閾値とに基づいて入力データを復号するか否かを判別し、復号する場合には該データの種別に応じて複数の復号手段15、16、17に出力する判別手段14とを備えて構成される。
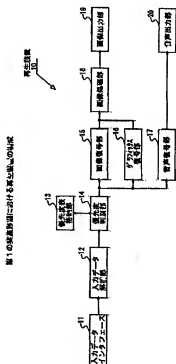
DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to playback equipment renewable with the track number according to the regeneration capability of self, when reproducing the picture image data which consists of two or more tracks.
[0002]
[Description of the Prior Art]In work of an image content, in order to provide two or more information, to give change to screen conversion or to protect the privacy or arts, special effects are used. How to record the picture image data after the edit which gives these special effects gives special effects on a recording medium, While recording original image data as it is, the procedure of special effects is also recorded, and there is the method of reproducing special effects by processing original image data according to the procedure of the special effects at the time of reproduction. Especially the latter is called non-destroying edit and can be edited using application software, such as QuickTime (Quick Time and the following write it as "QT".).
[0003]In the non-destroying edit which used QT, the file format of QT can describe not only special effects but the superimposition of a character or graphics to a picture. Namely, by the file format of QT, they are recorded on a recording medium by ID of an image etc. which add an exception, time of onset, end time, special effects, etc. of special effects and character graphics, and at the time of reproduction. The image accompanied by the same special effects as the editor added in edit by making it display on a display after performing the special effects etc. of the kind specified as the specified time to the specified picture is renewable.
[0004]
[Problem(s) to be Solved by the Invention]By the way, in such non-destroying edit, many special effects, characters, etc. may be put on original image data. In such a case, since a large number [the special effects etc. which should be simultaneously put on an original image], crossing the limit of the regeneration capability in the unit time of playback equipment arises. Playback equipment still had the problem of a reproduced image having been awkward or carrying out drop frame in order to reproduce all the special effects that are given to the original image.
[0005]So, in this invention, it aims at providing the playback equipment which can reproduce picture image data appropriately within the limits of regeneration capability by narrowing down selectively the special effects etc. which should be simultaneously put on an original image by a priority within the limits of regeneration capability.
[0006]
[Means for Solving the Problem]In playback equipment which reproduces picture image data which contains one or more editing data for editing image data and this image data in the 1st means concerning this invention, An input means as which said picture image data is inputted, and an analysis means to distinguish the contents of picture image data inputted by said input means, A priority ranking schedule which assigned turn of processing decoded for every contents of each data, A memory measure which memorizes a predetermined threshold which determines of which turn even data is reproduced, Two or more decoding means which are established according to classification of each data and decode each data, respectively, Based on said priority ranking schedule and said predetermined threshold which are memorized by the contents and said memory

11, the input data analyzing part 12, the priority table storage 13, the priority discrimination section 14, the image decoding part 15, the graphics decoding part 16, the voice decoding part 17, the image processing portion 18 image output part 19, and the voice output part 20, and is constituted.

[0014]The input data interface 11 is an interface which connects an external instrument and this playback equipment 10, and picture image data is inputted from the exterior. The inputted picture image data is outputted to the input data analyzing part 12. An external instrument is a drive device which reads the picture image data currently recorded from the disk shape recording medium, for example, and are a CD drive device which reads picture image data from CD-ROM, a DVD drive which reads picture image data from DVD, a hard disk drive apparatus, etc.

[0015]the contents of the data of the picture image data into which the input data analyzing part 12 was inputted -- that is, A video data, audio information, graphical data (title), graphical data (frame), graphical data (shade), etc. is distinguished, and a discriminated result is outputted to the priority discrimination section 14 with picture image data.

[0016]The priority discrimination section 14 determines the reproduction priority of the inputted picture image data according to the threshold set up beforehand by referring to the priority table stored in the priority table storage 13 based on a discriminated result. The priority discrimination section 14 cancels the picture image data concerned according to the determined reproduction priority, or outputs it to the image decoding part 15 or the graphic decoding part 16. A reproduction priority is superiority or inferiority of the track which should be reproduced, when both tracks cannot be simultaneously reproduced when two arbitrary tracks are chosen out of two or more tracks, but only one of tracks can be reproduced.

[0017]Here, based on the regeneration capability of the hardware in the playback equipment 10, a designer, a manufacturer, etc. of playback equipment determine a threshold beforehand, and set it as the priority discrimination section 14. As the priority table storage 13 is made to memorize this threshold beforehand, it may be made to make it read into the priority discrimination section 14 if needed.

[0018]The priority table storage 13 is read-only memory in which elimination like EEPROM (electrically erasable programmable read-only memory) is possible, and memorizes the below-mentioned priority table, for example.

[0019]After the image decoding part 15 decodes the inputted picture image data (video data), it is outputted to the image processing portion 18.

[0020]After the graphics decoding part 16 decodes the inputted picture image data (graphical data), it is outputted to the image processing portion 18.

[0021]Based on the video data and graphical data which were inputted, the image processing portion 18 outputs picture image data to the image output part 19, after performing predetermined graphics operation to an original image.

[0022]The image output part 19 outputs picture image data, after carrying out signal processing of the picture image data according to an external display.

[0023]On the other hand, after the voice decoding part 17 decodes the inputted voice data (audio information), it is outputted to the voice output part 20.

[0024]The voice output part 20 outputs voice data, after carrying out signal processing of the voice data according to an external sound reproduction device.

[0025]Next, operation of the playback equipment in a 1st embodiment is explained.

[0026]Drawing 2 is a figure showing an example of the input data in a 1st embodiment.

[0027]Drawing 3 is a flow chart which shows operation of the playback equipment in a 1st embodiment.

[0028]Drawing 4 is a figure showing the priority table in a 1st embodiment. Drawing 4 A is the 1st example of a priority table, and drawing 4 B is the 2nd example of a priority table.

[0029]First, input data is inputted into the input data analyzing part 12 via the input data interface 11. Input data is picture image data provided with a video data, audio information, and the graphical data of two or more kinds, and shows distinction of the contents of data to each data by classification of this track including the identifier which shows the classification of a track. The title (Title) the graphical data of two or more kinds indicates the title of an image to be, for example, The shade (Shade) which hides some screens in the shadow for frame (Frame) which borders a screen, privacy

graphical data (shade) 125 on the video data 121, and outputs it to the image output part 19.

[0038]for example, when a threshold is set to 5 from the simultaneous reproduction capability of the playback equipment 10. The video data 121, the audio information 122, the graphical data (title) 123, the graphical data (shade) 125, the graphical data (notice) 128, and the graphical data (accent) 127, respectively The image decoding part 15, It is outputted to the voice decoding part 17 or the graphics decoding part 16. . And the image processing portion 18 was decoded. Processing which piles up and displays the graphical data (title) 123, the graphical data (shade) 125, the graphical data (accent) 127, and the graphical data (notice) 128 on the video data 121 is performed, and it outputs to the image output part 19.

[0039]Thus, according to a 1st embodiment, since live data are reproduced within the limits of the throughput of the playback equipment 10 according to a priority, it is a smooth motion, and there is also no drop frame and picture image data can be reproduced. Since live data are reproduced within the limits of the throughput of the playback equipment 10 according to a priority, there is no necessity of creating picture image data according to the throughput of the playback equipment 10, and common picture image data can be used also in the playback equipment in which throughput differs. The image which piled up graphics which are different even if it is the same throughput is renewable by changing the priority assigned to the classification of each graphics.

[0040]Here, in the 1st priority table shown in <u>drawing 4</u> A, the priority of each graphics data is immobilization irrespective of the number of the graphics given simultaneously. Therefore, if a threshold is 3 when the live data which should be reproduced simultaneously are the video data 121, the audio information 122, and the graphics data (frame) 124, Since the priority of the graphics data (frame) 124 is 5 even if the throughput of the playback equipment 10 has a margin, the graphics data (frame) 124, It will not be outputted to the graphics decoding part 16, but only the video data 121 and the audio information 122 will be reproduced. Therefore, it is good to use the 2nd priority table shown in <u>drawing 4</u> B instead of the 1st priority table.

[0041]In <u>drawing 4</u> B, the 2nd priority table specifies the priority of each graphics according to the track of graphics which should be processed simultaneously.

[0042]As shown in the 1st line in the 2nd priority table, when the tracks of graphics processed simultaneously are a frame, a shade, a mark, an accent, and notice, As for 2 and the priority of an accent, the priority of 3 and notice is set [the priority of a frame / 1 and priority of a shade] to 4 for 5 and the priority of a mark. As shown in the 2nd line, when the tracks of graphics processed simultaneously are a title, a frame, and a shade, as for 1 and the priority of a frame, 2 and the priority of a shade are set to 2 for the priority of a title. When .... and the track of graphics simultaneously processed as shown in a final line are a mark, an accent, and notice, as for 1 and the priority of an accent, 2 and the priority of notice are set to 3 for the priority of a mark.

[0043]In the playback equipment 10 provided with such 2nd priority table. The track of the inputted picture image data The video data 121, the audio information 122, the graphics data (frame) 124, the graphics data (shade) 125, the graphics data (mark) 126, and graphics data. (Accent) In comprising 127 and the graphics data (notice) 128, the priority discrimination section 14 applies the priority of the 1st line in the 2nd priority table, and performs S12 and S13 of <u>drawing 3</u>. It follows, The picture image data which should be processed simultaneously The video data 121, the audio information 122, the graphics data (frame) 124, the graphics data (shade) 125, the graphics data (mark) 126, the graphics data (accent) 127. And when it is the graphics data (notice) 128, the graphics data (shade) 125, the graphics (accent) 127, and the graphics (notice) 128 are not reproduced as a threshold is 3.

[0044]When the track of the inputted picture image data comprises the video data 121, the audio information 122, the graphics data (title) 123, the graphics data (frame) 124, and the graphics data (shade) 125, The priority discrimination section 14 applies the priority of the 2nd line in the 2nd priority table, and performs S12 and S13 of <u>drawing 3</u>. In this case, since both the priorities of a frame and a shade are 2, when these graphics data are inputted simultaneously, the priority discrimination section 14 cancels both data.

[0045]Next, another embodiment is described.

(A 2nd embodiment) In a 1st embodiment, although only graphical data comprised two or more tracks, a 2nd embodiment is an embodiment when not only graphics data but audio information, text data, etc. comprise two or more tracks.

[0061]For example, when a threshold is set to 5 from the simultaneous reproduction capability of the playback equipment 30. The video 1 data 181, the audio 1 data 182, the text 1 data 187, and the text 2 data 188 are outputted to the image decoding part 15, the voice decoding part 17, or the text decoding part 32, respectively. And the image processing portion 18 performs processing which piles up and displays the text 1 data 187 and the text 2 data 188 on the video 1 decoded data 181, and outputs it to the image output part 19.

[0062]for example, when a threshold is set to 7 from the simultaneous reproduction capability of the playback equipment 30. The video 1 data 181, the audio 1 data 182, the audio 2 data 183, the graphics 1 data 185, the text 1 data 187, and the text 2 data 188 The image decoding part 15, the voice decoding part 17, the graphics decoding part 16. Or it is outputted to the text decoding part 32, respectively. And the image processing portion 18 performs processing which piles up and displays the graphic 1 data 185, the text 1 data 187, and the text 2 data 188 on the video 1 decoded data 181, and outputs it to the image output part 19.

[0063]Thus, according to a 2nd embodiment, since live data are reproduced within the limits of the throughput of the playback equipment 30 according to a priority, it is a smooth motion, and there is also no handicap and picture image data can be reproduced. Since live data are reproduced within the limits of the throughput of the playback equipment 30 according to a priority, there is no necessity of creating picture image data according to the throughput of the playback equipment 30, and common picture image data can be used also in the playback equipment in which throughput differs. By changing a priority, the image which piled up graphics which are different even if it is the same throughput is renewable.

[0064]It can respond to monaural reproduction or stereophonic reproduction by having two or more audio information. A title can also be displayed in two or more languages by having two or more text data.

[0065]Next, another embodiment is described.
(A 3rd embodiment) Although the threshold was chosen according to the classification of data, and the priority discrimination section 31 compared the priority and threshold of the track and had chosen [which outputs data to each decoding part according to the result / or or] whether it would discard in a 2nd embodiment using the 2nd priority table, A 3rd embodiment is an embodiment which establishes a discriminating means for every classification of data, and distinguishes the priority of input data for every classification of data.

[0066]Drawing 8 is a block diagram showing the composition of the playback equipment in a 3rd embodiment.

[0067]In drawing 8, the playback equipment 40 in a 3rd embodiment, The input data interface 11, the input data analyzing part 41, the priority table storage 35, the image data storage 42, the graphics data storage 44, the text data storage 46, the voice data storage part 48, the image data selection part 43, the graphics data selecting part 45, It has the text data selecting part 47, the voice data selecting part 49, the image decoding part 15, the graphics decoding part 16, the text decoding part 32, the voice decoding part 17, the image processing portion 18, the image output part 19, and the voice output part 20, and is constituted.

[0068]The input data interface 11 is connected to the input data analyzing part 41.

[0069]It is connected to the image data storage 42, the graphics data storage 44, the text data storage 46, and the voice data storage part 48, and the input data analyzing part 41 outputs input data to these each storage according to the data type of input data.

[0070]The image data storage 42 is a memory which stores a video data among input data, and is connected to the image data selection part 42. The graphics data storage 44 is a memory which stores graphics data among input data, and is connected to the graphics data selecting part 44. The text data storage 46 is a memory which stores text data among input data, and is connected to the text data selecting part 46. The voice data storage part 48 is a memory which stores voice data among input data, and is connected to the voice data selecting part 48.

[0071]The image data selection part 42 is connected to the priority table storage 35 and the image decoding part 15. The image data selection part 42 determines the reproduction priority of the inputted picture image data according to the threshold set up beforehand by referring to the priority table stored in the priority table storage 35 based on a discriminated result. The image data selection

concerned by referring to the threshold and priority which were acquired (S33).

[0088]As a result of comparing, a priority [in / in the text data selecting part 47 / the live data of the text concerned] outputs the live data of the text concerned to the text decoding part 32, when a priority is higher than a threshold (S34). On the other hand, as a result of comparing, a priority [in / in the text data selecting part 47 / the live data of the text concerned] discards the live data of the text concerned, when a priority is lower than a threshold.

[0089]Thus, in a 3rd embodiment, since the refreshable track number is specified for every classification of data, each data is appropriately renewable in the range of the ability to regenerate of playback equipment. Since the data volume which should be especially processed to unit time by classification of data differs, a threshold can be determined appropriately.

[0090]Next, another embodiment is described.

(A 4th embodiment) In an above-mentioned embodiment, when no track of data types exists, the case where the regeneration capability of playback equipment is not used arises. So, in a 4th embodiment, as it does not leave unused regeneration capability as much as possible, it is an embodiment which reproduces each data according to a priority.

[0091]Drawing 11 is a block diagram showing the composition of the playback equipment in a 4th embodiment.

[0092]In drawing 11, the playback equipment 50 in a 4th embodiment, The input data interface 11, the input data analyzing part 41, the image data storage 42, the graphics data storage 44, the text data storage 46, the voice data storage part 48, the data selection part 51, the priority table storage 37, the image decoding part 15, the graphics decoding part 16, It has the text decoding part 32, the voice data decoding part 17, the image processing portion 18, the image output part 19, and the voice output part 20, and is constituted.

[0093]The input data interface 11 is connected to the input data analyzing part 41. The input data analyzing part 41 is connected to the image data storage 42, the graphics data storage 44, the text data storage 46, and the voice data storage part 48.

[0094]The image data storage 42, the graphics data storage 44, the text data storage 46, and the voice data storage part 48 are connected to the data selection part 51.

[0095]The data selection part 51 discards whether each live data are outputted to any of the image decoding part 15, the graphics decoding part 16, the text decoding part 32, or the voice data decoding part 17 they are based on the priority and existence of the regeneration capability of the playback equipment 50, and each data so that it may mention later. The data selection part 51 reads the priority table storage 37, the maximum regeneration capability (MaxTrack), and the priority of each live data if needed.

[0096]Here, the priority table which gave the priority to the priority table storage 37 right through to all the tracks irrespective of the classification of a track is memorized.

[0097]Drawing 12 is a figure showing the priority table in a 4th embodiment.

[0098]In drawing 12, a priority table the priority of the video 1, for example 1, As for the priority of the video 2, 9 and the priority of the audio 1 6 and the priority of the audio 2 2, The priority of the audio 3 11 and the priority of the audio 4 12, The priority of the graphics 1 4 and the priority of the graphics 2 10, The priority of the graphics 3 5 and the priority of the graphics 4 15, the priority of the graphics 5 -- 17 and the priority of the text 1 -- as for 13 and the priority of the text 5, the priority of 14 and the text 6 is set [3 and the priority of the text 2 / 7 and the priority of the text 3] to 16 for 8 and the priority of the text 4. A priority is so high that a numerical value is small, and it is so low-priority that a numerical value is large.

[0099]The image decoding part 15, the graphics decoding part 16, and the text decoding part 32 are connected to the image processing portion 18. The image processing portion 18 is connected to the image output part 19. The voice decoding part 17 is connected to the voice output part 20.

[0100]Next, operation of the playback equipment in a 4th embodiment is explained.

[0101]Drawing 13 is a flow chart which shows operation of the data selection part in a 4th embodiment.

[0102]First, input data is inputted into the input data analyzing part 41 via the input data interface 11.

[0103]The input data analyzing part 41 distinguishes the data type of live data with reference to the

[0121]The input data analyzing part 41 distinguishes the data type of live data with reference to the identifier described in the track property atom, According to a discriminated result, input data is outputted to the image data storage 42, the graphics data storage 44, the text data storage 46, or the voice data storage part 48 with a discriminated result.

[0122]In drawing 14, the data selection part 51 initializes variables, such as the variable T1, T2, Tr, Tc, and Ts (S51).

[0123]Next, the data selection part 51 acquires the present time from a timer, and substitutes this current time for the variable T1 (S52).

[0124]Next, the data selection part 51 is calculated from a time Thu sample atom and a media hair drier atom, and acquires the frame rate of a video data (image data) (S53).

[0125]Next, the data selection part 51 calculates the processing time currently assigned in order to regenerate one frame, subtracts amendment time Tc required in order to process selection of a track, etc. from the processing time concerned, and substitutes a subtraction result for the variable Tr (S54). The variable Tr is the effectual time assigned in order to reproduce one frame.

[0126]Here, amendment time Tc is beforehand stored in the priority table storage 37 as a predetermined initial value, and while using this playback equipment after that, it is changed at the actually required time. A predetermined initial value, for example so that processing of selection of a track may certainly be performed, Two or more input data which arranges data so that more time may be taken in the processing which includes many tracks, and moreover identifies and chooses the high track of a priority is prepared, The time which it takes in actually inputting these data into playback equipment the processing which identifies and chooses the high track of a priority is measured, and it is considered as the processing time at the time of requiring time most in this measuring result.

[0127]Next, by accessing the priority table storage 37, the data selection part 51 identifies the track of a video data with the highest priority, and reads a video data from the image data storage 42 (S55).

[0128]Next, the data selection part 51 computes expended hours required in order to regenerate this read video data, and substitutes a computed result for the variable Ts (S56). Here, the time which regeneration takes differs according to the Codec type of data. for this reason, every -- it determines by asking for a statistical work, for example, average value, from the data of the processing time acquired about the Codec type by regenerating by inputting various data into playback equipment, and surveying processing time. A Codec type is a kind of the method of data-coding or decrypting, for example, in the case of video, is MPEG 2 etc.

[0129]Next, the data selection part 51 subtracts the variable Ts from the variable Tr, and makes a subtraction result the value of the new variable Tr (S57).

[0130]Next, the data selection part 51 adds the track of a video data read by S55 to a regenerated list (S58). A regenerated list is prepared for the priority table storage 37 as a table of track ID.

[0131]Next, by accessing the priority table storage 37, the data selection part 51 identifies the track of audio information with the highest priority, and reads audio information from the voice data storage part 48 (S59).

[0132]Next, the data selection part 51 computes expended hours required in order to regenerate this read audio information, and substitutes a computed result for the variable Ts. The data selection part 51 subtracts the variable Ts from the variable Tr, and makes a subtraction result the value of the new variable Tr. And the data selection part 51 adds the track of audio information read by S59 to a regenerated list (S60).

[0133]Thus, since the ability to regenerate is assigned with the priority to reproduction of a video data and audio information, reproduction of an image at its minimum is securable.

[0134]Next, the data selection part 51 judges whether regeneration capability remains in whether it is Tr>0 and playback equipment (S61).

[0135]Since remaining power is in regeneration capability as a result of judgment in being Tr>0, By accessing the priority table storage 37, it is the track stored in each storage, and the propriety of regeneration chooses the track of data with the highest priority in the track which has not been judged yet (S62).

[0136]Next, the data selection part 51 computes expended hours required in order to regenerate this

which remains can be regenerated, the data selection part 51 adds the track of data selected by S62 to a regenerated list (S65).

[0151]Next, the data selection part 51 subtracts the variable Ts from the variable Tr, makes a subtraction result the value of the new variable Tr, and returns processing to S61 (S66).

[0152]On the other hand, in S61, since regeneration capability does not remain in being variable Tr<=0, the data selection part 51 acquires the present time from a timer, and substitutes this current time for the variable T2 (S67).

[0153]Next, the data selection part 51 subtracts the variable T1 from the variable T2, substitutes a subtraction result for amendment time Tc, and changes it at the time when playback equipment actually required amendment time Tc (S68).

[0154]Since sufficient regeneration capability to regenerate selected data does not remain in S64 in being the variable Tr<= variable Ts, In order to judge whether there is any refreshable track within the limits of the regeneration capability which remains in other tracks except for the track concerned, the data selection part 51 is a track stored in each storage, and judges whether there is any track with which the propriety of regeneration has not been judged yet.

[0155]When there is a track with which the data selection part 51 does not judge the propriety of regeneration as a result of judgment, processing is returned to S61, and when there is no track which does not judge the propriety of regeneration, processing of S67 and processing of S68 are performed.

[0156]Thus, according to a 6th embodiment, since a refreshable track is altogether looked for in consideration of a priority within the limits of this regeneration capability while there is regeneration capability, it can use, without making the regeneration capability of playback equipment remain further compared with a 5th embodiment.

[0157]Next, another embodiment is described.

(A 7th embodiment) Although it presupposed as a precondition that the unit time in that regeneration is the same about all the tracks in 5th and 6th embodiments, it is a more general embodiment which does not need this precondition in this embodiment.

[0158]Drawing 16 is a flow chart which shows operation of the data selection part in a 7th embodiment.

[0159]First, input data is inputted into the input data analyzing part 41 via the input data interface 11.

[0160]The input data analyzing part 41 distinguishes the data type of live data with reference to the identifier described in the track property atom, According to a discriminated result, input data is outputted to the image data storage 42, the graphics data storage 44, the text data storage 46, or the voice data storage part 48 with a discriminated result.

[0161]In drawing 16, the data selection part 51 initializes variables, such as the variable T1, T2, Rt, Rc, Rp, Tc, and Tf (S81).

[0162]Next, the data selection part 51 is calculated from a time Thu sample atom and a media hair drier atom, and acquires the frame rate of a video data (image data) (S82).

[0163]Next, the data selection part 51 calculates the processing time currently assigned in order to regenerate one frame, and substitutes a calculation result for the variable Tf (S83). The variable Tf is the time assigned in order to reproduce one frame.

[0164]Next, the data selection part 51 does division of the amendment time Tc required in order to process selection of a track, etc. by the variable Tf, and substitutes a divided result for Rc (S84).

[0165]Next, the data selection part 51 rearranges each track in order of a priority for example, according to a priority table (S85).

[0166]Next, the data selection part 51 chooses the track reproduced at the time of a reproduction start within the limits of regeneration capability (S86).

[0167]The operation which chooses the track reproduced here at the time of this reproduction start is explained.

[0168]Drawing 17 is a flow chart which shows the operation which chooses the track at the time of a reproduction start.

[0169]In drawing 17, the data selection part 51 substitutes the variable Rc for the variable Rt which shows the total throughput of regeneration (S111).

[0190]Next, the data selection part 51 judges the size relation of the variable j and the variable n, when it is the variable j< variable n, calculates the throughput of the j-th track in a regenerated list, and substitutes a calculation result for Rs (S135).

[0191]Next, the data selection part 51 adds the value of the variable Rs to the variable Rt, and makes an added result the value of the new variable Rt (S136).

[0192]Next, the data selection part 51 adds 1 to loop variable j, is making an added result into the value of new loop variable j, *************s loop variable j, and returns processing to S134 (S137). Thus, the total throughput of the track registered into the regenerated list is re-calculated.

[0193]On the other hand, in S134, since each throughput was calculated about all the tracks registered into the regenerated list after deleting the track which regeneration ended and the total throughput was re-calculated when it was the variable j>= variable n, processing is returned to S91 (drawing 16) of a main routine (S138).

[0194]Since remaining power has produced only the throughput of the track which regeneration ended in the regeneration capability of playback equipment, S92 thru/or S100 are processed that the track which can be regenerated by this remaining power should be searched, and it should reproduce.

[0195]That is, it returns to drawing 16, and by accessing the priority table storage 37, the data selection part 51 is a track stored in each storage, and chooses the track of data with the highest priority in the track which is not registered into a regenerated list (S92).

[0196]Next, the data selection part 51 computes a throughput required in order to regenerate this selected data, and substitutes a computed result for the variable Rp (S93).

[0197]Next, it is judged whether the data selection part 51 has the added result smaller than 1.0 which added the value of the variable Rs to the variable Rt (S94).

[0198]Since it is possible to reproduce the selected track when it is <=(variable Rt+ variable Rp) 1.0 as a result of judgment, the selected track is added to a regenerated list (S95). And the data selection part 51 adds the value of the variable Rs to the variable Rt, makes an added result the value of the new variable Rt, and returns processing to S92 (S96).

[0199]On the other hand, in being >(variable Rt+ variable Rp) 1.0 as a result of judgment by S94, Giving up reproduction of the track chosen since the regeneration capability to reproduce the selected track did not remain, the data selection part 51 acquires the present time from a timer, and substitutes current time for the variable T2 (S97).

[0200]Next, the data selection part 51 subtracts the variable T1 from the variable T2, substitutes a subtraction result for amendment time Tc, and changes it at the time when playback equipment actually required amendment time Tc (S98).

[0201]Next, the data selection part 51 does division of the amendment time Tc by the variable Tf, and substitutes a divided result for Rc (S84).

[0202]Next, according to the contents of data, the data selection part 51 accesses the priority table storage 37, output each data which should be reproduced according to a regenerated list to the image decoding part 15, the graphic decoding part 16, the text decoding part 32, or the voice data decoding part 17, and playback equipment, Reproduction of an image is started (S100). And the data selection part 51 returns processing to S88.

[0203]Thus, in a 7th embodiment, about all the tracks, even when the unit time in the regeneration is not the same, Since it will choose one by one if regeneration capability produces the track of data with the highest priority in consideration of a actual throughput in the track to which it is the track stored in each storage, and regeneration capability has not been assigned yet, It can use without making the regeneration capability of playback equipment remain compared with a 4th embodiment.

[0204]
[Effect of the Invention]As explained above, since the playback equipment concerning this invention reproduces the track in picture image data within the limits of the ability to regenerate, it does not have drop frame at a smooth motion, either, and can reproduce an image.

[Translation done.]